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PRINCIPLES OF ORGAN REGISTRATION APPLIED TO THE ORGAN SONATAS OF PAUL HINDEMITH

by

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INTRODUCTION

Tonal concepts of organ music developed along with progress in church organ design. These developments in Germany may therefore be traced back through reference to the tonal design of representative instruments of various eras of German church organ building. Similar developments took place in other countries, as well as developments effecting the Positive, Regal, Portative, street organ, concert organ, and theater organ; but these are beyond the scope of this investigation.

Paul Hindemith grew up in an environment of German music. Although his sonatas are highly original in their conception, and are not written in the traditional style of German church organ music, or concert organ music, he had the proper perception of the peculiarity of organ sound which was rooted in the history of German organ tradition. His first two sonatas were composed in Germany, the third in the United States of America shortly after his immigration.

This essay establishes tonal concepts of German church organ design, and applies these principles to the registration and performance of Hindemith's organ sonatas.

CHAPTER I

HISTORIC DEVELOPMENT OF TONAL CONCEPTS

The Organ before 1300 A.D.

Organs were known to have existed before 1300 A.D. in Germany.[1] These instruments were built as Blockwerks-- the same note sounded on all ranks when one key was depressed; there was no provision for separating individual ranks through stops. The organ tone therefore sounded as a large mixture composed of pipes which represented the fundamental tone as well as partials in octaves and fifths. The shape of the organ pipes was cylindrical. All pipes of the same rank had the same circumference, resulting in an unbalanced sound--the larger pipes sounded more string-like; those of the middle register, principal-like, and pipes of the treble, flute-like.

It is evident that the ensemble playing in octaves and fifths of the cylindric open pipes, which developed later into the principal chorus, was from the beginning a main tonal concept of organ sound.

The Organ of the Fourteenth Century

A few organs built in the fourteenth century had already offered devices for selecting certain ranks which could be played

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[1] A number of early organs are mentioned in Die Musik in Geschichte und Gegenwart., vol. 10. col 266. Organs which were built in the tenth century are those of Cologne and Werden; in the eleventh century, Erfurt, Halberstadt, Magdeburg, and Weltenburg; in the twelfth century, Konstanz, and Merseburg; in the thirteenth century, Bergedorf, Bonn, Engelberg, Luebeck, Mainz, Ratzeburg, Salzburg Wetzlar and Worms.

separately. The organ of Halberstadt, built during the period 1357 to 1361 by Nikolaus Faber, consisted of a Hauptwerk and a Pedalwerk. Both divisions had two keyboards. One keyboard was used only for fundamental pipes (probably 16', 8', 4' and additionally in the pedal, 32'). The other keyboard was used for a huge mixture (in manual, 32 to 56 ranks, and in the pedal, 16 to 24 ranks) in addition to the fundamental pipes. This grouping of two keyboards for Hauptwerk as well as Pedal was made possible by means of a double chest. The sound of this enormous instrument must have been crude. The pyramid of principal chorus was not built high enough, there were too many doublings of fundamentals and lower partials, and the scaling of the pipes had still much similarity with the old fixed diameter scaling. Praetorius describes the sound of this organ as follows:

> The larger Praestants and the low manual-compass, which does not rise high enough for lightness of sound, caused together a deep coarse rumbling as of a dreadful distant thunder, while the many rank mixture gave an exceeding shrillness, strong loud and powerful.[2]

An organ builtbetween 1393 and 1394 in Bartenstein, East Prussia, by Master Paul, had four registration alternatives, probably selected by manipulating the direction of the wind into the appropriate chest:

Principals 8' + 4'
Principals 16' + 8' + mixture
Principals 16' + 8' + 4' + mixture
Principals 16' + 8' + 4'.

The first organ with stops was built in Trier between 1387 and 1388, but the classification or names of the stops is not known. It is evident, therefore, that even if the organs of the fourteenth century

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[2]Translated and quoted by Peter Williams, The European Organ 1450 - 1850 (Nashua: The Organ Literature Foundation, 1967), p. 18.

lacked both the singing quality of the principals and the silver tones of the mixtures of later centuries, two concepts of organ sound had been established.

The fundamental sound was the principals 8' and 4', and to this could be added the mixtures which produced the so-called organum plenum (full organ).

The Organ of the Fifteenth Century

During the fifteenth century the organ developed into an instrument with more refinement in both sound and control. The most important invention of that time, the spring and slider chest, made possible the separation of single ranks (stops) as well as the combination of them. Through this innovation the Blockwerk was divided into fundamentals and lower partials each of which appeared as single stops. The remaining higher partials were gathered together in one or two mixtures. As time went on the mixtures were equipped with higher partials made possible partly through "breaks" or repetition within the ranks. As the fixed diameter scaling of the medieval organ pipe gradually disappeared, the sound of a whole rank became in itself stabilized and balanced, making principal pipes sound principal-like throughout the entire range. Sometimes the old Blockwerk, still retained in the Hauptwerk, remained the most important pleno ensemble; but now it had a more attractive tone through the building of higher mixtures, and more fullness of sound as a result of the discarding of the old fixed diameter scaling. Another important development in the organ history of this time was the combination of already existing small-type organs, Portative and Positive, with the great church organ, providing greater tonal variety and flexibility. Widescale pipes such as gedeckts and

flutes were invented at this time, and the first reed pipes also came into existence. Specifications of two organs built at the end of the fifteenth century illustrate this development:

Figure 1

The organ in the Augustinian Monastery, Langensalza, built by Johannes von Bergen, 1494

HAUPTWERK	Principal 16'
	Octave 8'
	Mixture
	Zimbel
	Zink 8'
RUECKPOSITIV	Gross Floete 8'
	Klein Floete 4'
	Zimbel
PEDAL	Principal 16'
	(duplexed)
	Octave 8'
	(duplexed)
	Zimbel
	(duplexed)

SOURCE: Hans Klotz, The Organ Handbook, trans. Gerhard Krapf (Saint Louis: Concordia Publishing House, 1969), p. 137.

Figure 2

The organ in St. Wolfgang, Austria, built by Michael Khall, Budweis, 1497

HAUPTWERK	Principal 8'
	Hoelzern Octav 4'
	Quint 3'
	Octav 2'
	Zimbel
	Scharfe Mixtur
RUECKPOSITIV	Gedeckt 8'
	Floete 4'
	Hölzern Principal 2'
	Hintersatz
PEDAL	Principal 16'
	Octav 8'
	Zimbel

SOURCE: William Leslie Sumner, The Organ (London: MacDonald, 1973), p. 392.

It is evident that two-manual organs of this time offered two organo plena, one on the Hauptwerk and the other on the Rückpositive using a Hintersatz or Zimbel. Echo effects between the organo pleno could therefore be accomplished. Several duo and trio combinations were possible on both the organs described in Figures 1 and 2. The organ of St. Wolfgang offered minor organo plena (8' + 4' + 2') on both manuals as well as elective combinations, gedeckt 8' + principal 2' or gedeckt 8' + zimbel. New possibilities for accompaniment with wide-scaled stops were given through gedeckt 8', or gedeckt 8' + flöte 4'. Canto firmo playing with reed stops in the Augustinian Monastery was made possible through use of the Zink 8'. This reed could be added to the organo pleno, varying the sound to a kind of reed organo pleno.

The Organ of the Early Sixteenth Century

The organ of the early sixteenth century expanded the new possibilities which had begun in the fifteenth century with the invention of the slider chest. Much attention was focused still on the refinement of the principal chorus in an attempt to add sweetness to the principals and sweet sharpness to the mixtures.

The group of wide-scaled stops was enlarged (flutes to 2' level), and narrow-scale stops were invented (Quintade, Querpfeife).

Hornwerks, which are a mutation of pipes bringing out the third and fifth partial, often still in combination with other aliquots, came into existence. Well-known stops of this category were Kornett, Sesquialtera, Hörnle and Nachthorn. New reed pipes with long resonators (Trompete, Schalmei, Posaune) and also those with short resonators (Regal, Baarpfeife, Musette, Dulzian, Krummhorn) came into high esteem.

The following specifications of representative organs built or planned in the early sixteenth century give witness to this expanded nomenclature.

Figure 3

The organ of the cathedral in Trier built by Peter Breisiger, Koblenz, 1537

HAUPTWERK	Principal 8'
	Octave 4'
	Zimbel
	Mixtur
	Nachthorn VI
	Zink 8'
RUECKPOSITIV	Quintade 8'
	Principal 4'
	Octave 1'
	Scharfe Zimbel
	Hohlpfeife 4'
	Querpfeife 4'
	Flöte 2'
	Schalmei 4' (Krummhorn)
PEDAL	Principal 16'
	Octave 8'
	Zimbel 4'
	Hohlpfeife 8'
	Posaune 8'

SOURCE: Hans Klotz, Über die Orgelkunst der Gotik, der Renaissance und des Barock (Kassel: Bärenreiter-Verlag, 1975), p. 96

Arnolt Schlick (1460-1521) describes in his Spiegel der Orgelmacher und Organisten (1511) his vision of a perfect organ. He speaks of scaling and arrangements of mixtures. His recommendation for a two-manual organ is as follows:

Figure 4

HAUPTWERK	Principal 8'
	Octave 4'
	Hintersatz - XVI, XVII, XVIII
	Kleine Zimbel
	Hölzern Glaechter 8'
	Gemshorn 4'
	Rauschpfeife or Krummhorn 8'
	Zink 8'
	Regal 8'

RUECKPOSITIV Hintersatzlein
Zimbellein
Hoelzern Principal 4'
Gemshörnlein 2'

PEDAL Principal 16'
Octave 8'
Hintersatz
Trompete 8'

It is evident that the early sixteenth century offered organs which had the quality of two organo plena (on each manual division, both full and elective) to which reeds could be added (Zink, Krummhorn, Schalmei). New stops with wide scaling offered new potentials of chamber-music-like combinations (for example, Hohlpfeife + Flöte 2').

Narrow scaled pipes such as Quintade 8' and Querpfeife 4" could be used soloistically or in other combinations, as, for instance, with ranks from the principal chorus (for example, Quintade 8' + Octave 1').

Reeds with both full and short resonators offered many canto-solo-possibilities bringing out melodic lines through the different tone colour of the lingual pipe. They are attractive with combinations of stops selectively chosen from either the principal pyramid or the flute family. All the above mentioned specifications of this era offered the pedal Trompete 8' (Posaune 8') whereby a bass cantus firmus could be expressed more intensively.

The organ in Trier had a Nachthorn VI containing among other aliquots the 2 2/3' and 1 3/5' through which another alternative for colouring a cantus firmus with labial pipes was given. Adding the Nachthorn VI to the organo pleno with reeds included would colour the full Werk into a French Grandjeu.

The Organ of the Late Sixteenth Century and Early Seventeenth Century

During the late Renaissance and early Baroque the organ expanded its nomenclature. Often it developed into a three-manual instrument in which a small portable organ of the Renaissance, having only reed pipes (the Regal), was incorported into the big church organ as the Brustwerk. It was here supplemented with flue pipes of smaller size or, instead of a Brustwerk, an Oberwerk was built (a division above the Hauptwerk).

Praetorius, in his Syntagma Musicum, vol. II, "De Organographia" (1618), lists proudly many organ dispositions of his time.

The Organ became a well developed instrument for the renowned organ composers, Samuel Scheidt (1587-1653), Franz Tunder (1614-1667), Nikolaus Bruhns (1665-1697), Dietrich Buxtehude (1637-1707) and others. A number of outstanding organ builders such as Esaias Compenius, Hans Scherer and Gottfried Fritzsche were working at this time. Some of the dispositions bear witness to this great development.

Figure 5

Danzig, St. Marien (1583/13. Oktober 1585 Julus Antoni aus Bergues-Saint-Vinocq, Gent)

HAUPTWERK

Prinzipal 16'	Hohlflöte 16'
Oktave 8'	Quintaden 16'
Oktave 4'	Spillflöte
Rauschquinte (2 2/3')	Quintaden 8'
Superoktave 2'	Offenflöte 8'
Mixtur XXIV	Spillflöte 4'

RUECKPOSITIV

Prinzipal 8'	Hohlflöte 8'	Trompete 8'
Octave 4'	Spillpfeife 8'	Krummhorn 8'
Rauschquinte 2 2/3'	Blockflöte	Zink 4'
Superoktave 2'	Offenflöte 4'	Schalmei 4'
Mixtur	Nasard 2 2/3'	
Zimbel	Gemshorn 2'	
	Sifflett 1 1/3'	
	Waldflöte 1'	

BRUSTWERK

Prinzipal 4'	Gedeckt 8'	Regal 8'
Dezchen 2'	Hohlflöte 4'	Zink 4'
Zimbel	Quintaden 4'	

PEDAL

Oktave 8'	Unterbass/Gedeckt 32'	Posaune 16'
Superoktave 4'	Unterbass/Gedeckt 16'	Trompete 8'
Rauschquinte 2 2/3'	Gedeckt 8'	Krummhorn 8'
Mixtur	Quintadene 4'	Schalmei 4'
Zimbel	Spitzquinte 2 2/3'	Kornett 2'
	Nachthorn 2'	
	Bauernpfeife 1'	

SOURCE: Hans Klotz, Über die Orgelkunst der Gotik, der Renaissance und des Barock (Kassel: Bärenreiter-Verlag, 1975), p. 183

The organo pleno of this organ is built on 16' foundation in the Hauptwerk, 8' foundation in the Rueckpositive, 4' foundation in the Brustwerk. The Pedal substitutes the principal in the 16' and 32' level with gedeckts, but a principal chorus is built from 8' upward. The wide-scale pipes (flutes, gedeckts, etc.) are richly represented in every division of the organ, especially in Pedal and Rueckpositive (in Pedal, 32' to 1'; Rueckpositive, 8' to 1'). Missing throughout is only a Sesquialtera or 1 3/5' in any version.

Reeds with short and long resonators are represented in great variety especially in Rueckpositive and Pedal, but not in Hauptwerk. The Pedal can be played independently without couplers.

Figure 6

Bueckeburg, Stadtkirche (1615 Esaias Compenius, Magdeburg)

OBERWERK

Prinzipal 16'	Quintaden 16'	
Oktave 8'	Gemshorn 8'	
Mixtur VIII-XIV	Viola da gamba 8'	
Oktave	Gedeckte Blockpfeife 8'	
	Querpfeife 4'	
	Gemshornquinte 2 2/3'	
	Flachflöte 2'	

RÜCKPOSITIV

Prinzipal 8'	Nachthorn 8'	Rankett 16'
Oktave 2'	Gedecktflöte 8'	Krummhorn 8'
Klingede-	Nasardpfeife 4'	
Zimbel III	Spillpfeife 4'	
	Rohrflöte 4'	
	Sifflett 1'	

BRUSTWERK

Zimbel II	Rohrflöte 8'	Regal 8'
	Offenflöte 4'	Geigend Regal 4'
	Nachthorn 4'	
	Gemshorn 2'	
	Hohlquinte 1 1/3'	

PEDAL

Oktave 4'	Subbass 32'	Posaune/Bombarde 16'
Zimbel III	Rohrflöte 16'	Sordun 16'
	Gemshorn 16'	Trompete 8'
	Hohlpfeife 8'	Dulzian 8'
	Nachthorn 8'	Kornett 2'
	Querflöte 8'	
	Gemshorn 4'	
	Nachthorn 2'	
	Bauernflöte 1'	

SOURCE: Hans Klotz, Über die Orgelkunst der Gotik, der Renaissance und des Barock (Kassel: Bärenreiter-Verlag, 1975), p. 215.

The principal chorus of this organ is complete in the Hauptwerk; the other divisions make only an elective organo pleno available. Non-

principal flue pipes are represented in wide and narrow scaling (open, stopped, conical, overblowing) in all divisions and at all levels except 1 3/5. Reed pipes with short resonators can be played in Rückpositive (16' and 8') and Brustwerk (8' and 4') but not in Hauptwerk. Long and short resonating reeds are available in the pedal division. Here again the pedal division is richly supplied with flue pipes so that it can be used independently.

Figure 7

Braunschweig, St. Ulrici (April,1626 Gottfried Fritzsche, Meissen)

OBERWERK

Prinzipal 8'	Gemshorn 8'	Dulzian 16'
Scharfe Rauschpfeife II		
Scharfe Zimbel II		

HAUPTWERK

Prinzipal 8'	Subbass 16'	Trompete 8' oder 16'
Scharfe Oktave 4'	Hohlflöte 8'	
Quinte 2 2/3'		
Mixtur VI		

POSTIVE

Prinzipal 4'	Quintaden 8'	Lieblich Krummhorn 8'
Oktave 2'	Blockflöte 4'	
Zimbel II	Schwiegel	

PEDAL

Prinzipal 16'	Subbass 16'	Starke Posaune 16'
Starke Oktave 4'		Singend Kornett 2'
Rauschpfeife IV		
Zimbel II		

SOURCE: Hans Klotz, Über die Orgelkunst der Gotik, der Renaissance und des Barock (Kassel: Bärenreiter-Verlag, 1975), p. 224.

The principal chorus of this organ is established in all divisions without gaps (Rückpositiv on 4' basis, Pedal on 16' basis). Non-principal flue pipes are available, but not as abundantly as in the previously described organs of this period; notable is the absence of higher partials.

Reeds are represented in every division.

There are few suggestions of this time remaining which show the use and combination of stops. Those available are of great interest for us today because they illustrate the registration of that time. Three of these registration suggestions are given below.

The oldest source of registration is for the organ in Worms built in 1550. The disposition shows the following stops:

Figure 8a

MANUAL

1) Prinzipal
2) Octave 4'
3) Quinte 2 2/3'
4) Mixtur
5) Zimbel
6) Grosse Hohlflöte 8'
7) Kleine Hohlflöte 4'
8) Rauschwerk 8'

PEDAL

9) Prinzipal
10) Octave 8'
11) Mixtur
12) Posaune 8'

13) Tremulant
14) Trommel in C.

The suggestions for registration are as follows:

Figure 8b

Stops to be played singly: 1, 6, 7 as well as 2.
Two-stop combinations: 1 2, 1 6, 1 7, 6 7.
Three-stop combinations: 3 6 8.
Mixtures are only used for the full organ, Zimbel sounds well with Hohlflöte 8' and 4' together.

SOURCE: Hans Klotz, Über die Orgelkunst der Gotik, der Renaissance und des Barock (Kassel: Bärenreiter-Verlag, 1975), p. 227.

The organ builder Harmen Raphael Rodensteen built, in 1563, a one-manual organ at the Schlosskirche (courtchapel) in Dresden and recommended a number of registration possibilities.

The specification was as follows:

Figure 9a

1) Prinzipal 8'	5) Quintaden 16'	11) Trompete 8'
2) Oktave 4'	6) Gedeckt 8'	12) Krummhorn 8'
3) Mixtur	7) Flöte 4'	13) Regal 8'
4) Zimbel	8) Querpfeife 4'	14) Tremulant
	9) Gemshorn 2'	
	10) Sifflet 1'	

Pedal 16' and Coupler

His suggestions for registration on this instrument are as follows:

Figure 9b

Stops to be played singly: No. 1, 5, 6, 7, 8, 9, 11, 12, 13.
Two-stop combination: Prinzipal with No. 2, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14.
Octave with 7, 8, 11, 12, 13.
Zimbel with 7, 10, 11, 12, 13.
Gedeckt with 4, 5, 7, 8, 9, 10, 11, 12, 13, 14.
Gemshorn with 7, 12, 13.
Quintaden with 2, 4, 7, 8, 10, 11, 13, 14.
Gemshorn with 7, 10, 12, 13.
Sifflet with 7, 12, 13.
Quintaden with 2, 4, 7, 8, 9, 10, 11, 12, 13, 14.
Querpfeife with 10, 11, 12, 13.
Trompete with 7.
Krummhorn with 7.
Regal with 7.
Three-stop combination: Prinzipal with 2 6, 4 6.
Oktave with 4 5.
Zimbel with 7 11, 8 10.
Gedeckt with 2 5.
Querpfeife with 9 10.
Four-stop combination: Prinzipal with 2 4 6.
Gedeckt with 2 4 5.
Five-stop combination: Prinzipal with 2 3 4 6.

SOURCE: Hans Klotz, Über die Orgelkunst der Gotik, der Renaissance und des Barock (Kassel: Bärenreiter-Verlag, 1975), p. 193.

An interesting suggestion for registration is handed down from Timotheus Compenius who, with H. R. Rodensteen, built the organ in Bayreuth, Stadtkirche with the following disposition:

Figure 10a

MANUAL

1) Prinzipal 8'	5) Quintade 16'	11) Krummhorn 8'
2) Octave 4'	6) Grobgedeckt 8'	
3) Mixtur	7) Koppelflöte 8'	

4) Zimbel
8) Quintflöte 2 2/3'
9) Flachflöte 2'
10) Sifflet 1'

PEDAL

12) Prinzipal 8'
13) Subbass 16'
14) Posaune 8'
15) Kornett 2'
16) Tremulant,
17) Trommel,
18) Vogelgesang,
19) Zimbelstern

The following combinations are suggested:

Figure 10b

A) 1 2 3 4 5 8 12 13 14 (called full organ)
B) 5 7 11 12 13
C) 6 9 13 16
D) 1 2 5 8 12 14
E) 6 13 15
F) 5 8 12 14
G) 6 10 13 16
H) 5 11 13 14
I) 1 12
J) 6 11 13

In another one of his writings Compenius states that is is not good to multiply stops of equal pitch.

SOURCE: Hans Klotz, Über die Orgelkunst der Gotik, der Renaissance und des Barock (Kassel: Bärenreiter-Verlag, 1975), pp. 230 - 231.

It is evident that organo pleno consists only of the principal chorus, except that a flute or gedeckt 8' can serve as substitute. A gedeckt 8' may, as well, be added to the principal chorus to bring out more fullness of fundamental sound demanded by the texture of the piece. In choosing other combinations the greatest freedom seems to be given. There is no fixed set of combinations as in the French organ literature;[3] but adding stops of equal foot length is seldom found. To combine stops of different colour is especially favoured by Compenius. To choose

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[3] Fenner Douglass lists in his book The Language of the Classical French Organ (New Haven and London: Yale University Press, 1969) instructions for registration of the French classical organ music (1665 - 1770); for example, the meaning of Grand jeux, Fugue, Le Duo, Trio à dessus, La Tierce, Jeux doux and many others, for the different composers of that era.

stops electively and to vary the sound through the additions of reeds seems to be typically German.

Therefore one can say that three main principles for registration are valid:

I. The organo pleno (principal chorus)
II. Elective combinations (choosing single non-principal flue pipes in combination with aliquots)
III. Reed coloration

The above-mentioned principles can be diversified according to style and texture of music, and to the instrument and the acoustical environment in which the music is played; for example, an organo pleno consists of any one of the following combinations:

Prinzipal 8'
Oktave 4'
Prinzipal 8' + Oktave 4'
Prinzipal 8' + Oktave 2'
Prinzipal 8' + Oktave 4' + Oktave 2'
Prinzipal 8' + Oktave 4' + Quinte 2 2/3' + Oktave 2'
Prinzipal 8' + Oktave 4' + Quinte 2 2/3' + Oktave 2' + Mixture
Prinzipal 8' + Mixture
Prinzipal 8" + Oktave 4' + Mixture

The list can be extended through a 16' foundation stop or through a second mixture (a Zimbel or Scharff), furthermore the Prinzipal 8' can be substituted by a Gedeckt 8' or Flute 8' as long as the higher partials above the 8' pitch are in principal scaling.

As for reed coloration, a long resonating reed (Trompete) could be combined with any of the above mentioned pleno combinations; or any single stop of the principal chorus could be chosen with a long resonating reed to create the colour for a canto solo. The short resonating reeds are more often combined with minor organo plena or with single aliquots of either flute or principal family as, for example,

Krummhorn 8' + Spillpfeife 4'
Krummhorn 8' + Nasart 2 2/3'
Krummhorn 8' + Quinte 1 1/3'
Krummhorn 8' + Rohrflöte 4' + Sifflett 1'

Elective combinations (a single foundational, non-principal flue pipe, alone or in combinations with other aliquots) can be selected in great variety as, for example:

Gedeckt 8' + Gemshornquinte 2 2/3'
Nachthorn 8' + Rohrflöte 4' + Sifflet 1'
Rohrflöte 8' + Hohlquinte 1 1/3'
Quintade 16' + Gemshorn 8'
Gemshorn 8' + Flachflöte 2'

The Organ from 1650 to 1750

The climax of organ design was reached during the years 1650 to 1750. Excellent organ builders such as Arp Schnitger (1648-1720) and Gottfried Silbermann (1683-1753) and many others were creating outstanding instruments, superb in material, craftsmanship and tonal design (disposition, scaling and intonation). On two-, three-, or four-manual organs, every division had a complete principal chorus which was crowned with a Mixture, Scharff, Zimbel, or the like. The basis of the principal chorus was as follows:

Pedal	32' or 16'
Hauptwerk	16' or 8'
Rückpositive	8' or 4'
Oberwerk	8' or 4'
Brustwerk	4' or 2'

Both wide and narrow flue pipes were represented in every division in great variety including aliquots of the third (Sesquialtera, Kornett). A rich battery of reeds (both long and short resonators) was available.

The specifications of three famous Baroque organs which exemplify the climax of German organ design are given below. The first is the organ of St. Jacobi in Hamburg at which Adam Reinken played. Bach walked long distances several times to hear this instrument. He later applied for the organist position, but his application

was rejected. The next specification (Figure 12) is that of the organ of St. Mary's at Luebeck. Both Tunder and Dietrich Buxtehude had served as organists at St. Mary's. Again, Bach journeyed long distances to hear this beautiful instrument played by Buxtehude at his famous Abendmusiken.

The third organ (Figure 13) was also known to Bach and may still be heard today on many recordings.

Figure 11

Hamburg, St. Jacobi (built by Gottfried Fritzsche and Arp Schnitger)

HAUPTWERK

Prinzipal 16'	Quintade 16'	Trompete 16'
Oktave 8'	Spitzfloete 8'	
Oktave 4'	Gedeckt 8'	
Oktave 2'	Rohrfloete 4'	
Rauschpfeife II	Flachfloete 2'	
Mixtur VI - VIII		

RUECKPOSITIVE

Prinzipal 8'	Gedeckt 8'	Dulzian 16'
Oktave 4'	Quintade 8'	Baerpfeife 8'
Oktave 2'	Blockfloete 4'	Schalmey 4'
Quinte 2 2/3'	Querfloete 4'	
Sesquialtera II	Siffloete 1 1/3'	
Scharf VI - VIII		

OBERWERK

Prinzipal 8'	Holzfloete 8'	Dulzian 8'
Oktave 4'	Rohrfloete 8'	Trechterregal 8'
Oktave 2'	Spitzfloete 4'	
Scharf IV - VI	Nasat 2 2/3'	
Cimbel II	Gemshorn 2'	

PEDAL

Prinzipal 32'	Subbass 16'	Posaune 32'
Oktave 16'	Nachthorn 2'	Posaune 16'
Oktave 8'		Dulzian 16'
Oktave 4'		Trompete 8'
Rauschpfeife III		Trompete 4'
Mixtur VI - VIII		Cornet 2'

SOURCE: Jack C. Goode, Pipe Organ Registration (Nashville: Abingdon Press, 1964), pp. 101 - 102.

Figure 12

Luebeck, St. Marien (built by B. Hering, Jakob Scherer, Gottschalk J. Burkhard, Friedrich Stellwagen)

HAUPTWERK

Prinzipal 16'	Quintaden 16'	Trompete 16'
Oktave 8'	Spitzfloete 8'	Trompete 8'
Superoktave 4'	Hohlfloete 4'	Zink 8'
Rauschquinte II	Nasard 2 2/3'	
Mixtur X - XV		
Scharf IV		

POSITIVE

Prinzipal 8'	Bordun 16'	Dulzian 16'
Oktave 4'	Hohlpfeife 8'	Baarpfeife 8'
Mixtur V	Quintade 8'	Trichterregal 8'
Scharf V	Blockfloete 4'	Schalmei 4'
Zimbel II	Spillfloete 2'	

BRUSTWERK

Prinzipal 8'	Gedeckt 8'	Krummhorn 8'
Oktave 4'	Hohlfloete 4'	Regal 8'
Sesquialter II	Gemshorn 2'	
Mixtur VI - VIII	Feldfloete 2'	
Zimbel III	Sifflett 1 1/3'	

PEDAL

Prinzipal 32'	Subbass 16'	Posaune 32'
Grosse Oktave 16'	Gedeckt 8'	Posaune 16'
Kleine Oktave 8'	Nachthorn 2'	Dulzian 16'
Superoktave 4'	Bauernpfeife 1'	Trompete 8'
Mixtur VI		Krummhorn 8'
		Kornett 2'

SOURCE: Hans Klotz, Über die Orgelkunst der Gotik, der Renaissance und des Barock (Kassel: Bärenreiter-Verlag, 1975), pp. 321-322.

Figure 13

Freiberg, Cathedral (built by G. Silbermann, 1710 - 1714)

HAUPTWERK

Prinzipal	Bourdon 16'	Trompete 8'
Oktave 4'	Rohrfloete 8'	
Quinte 2 2/3'	Viola da Gamba 8'	
Superoktave 2'	Tierce 1 3/5'	
Mixture IV	Cornet V	
Zimbel III	Clarin 4' (flue pipes)	

OBERWERK

Prinzipal 8'	Quintade 16'	Krummhorn 8'
Oktave 4'	Gedackt 8'	Vox humana 8'
Superoktave 2'	Quintade 8'	
Mixtur III	Spitzfloete 4'	
Zimbel II	Flachfloete 1'	
	Cornet V	

BRUSTWERK

Prinzipal 4'	Gedackt 8'
Oktave 2'	Rohrfloete 4'
Quinte 1 1/3'	Nasat 2 2/3'
Mixtur III	Tierce 1 3/5'
	Siffloete 1'

PEDAL

Prinzipal 16'	Untersatz 32'	Posaune 16'
Oktave 8'	Oktave 16' (open wood)	Trompete 8'
Oktave 4'	Subbass 16'	Clarin 4'
Mixtur VI		

SOURCE: Peter Williams, The European Organ 1450 - 1850 (Nashua: The Organ Literature Foundation, 1967), pp. 151 - 152.

A few suggestions of this time are available regarding the use and combination of the stops. Three of these are given below. They are of special interest for us today because they provide a glance into the registration practice of the mature Baroque era.

The organist of the Garnisonkirche in Berlin published in 1727 a booklet in which he speaks as follows of the usefulness of many stops of his newly built instrument:

Figure 14

HAUPTWERK

Bourdon 16: good with Quintatön 8' or Spitzflöte 4'.
Rohrflöte 8': can be used with Spitzflöte 4', Waldflöte 2' and Sifflöte 1'.
Viola da Gamba 8': a Spitzflöte, gentle in tone.
Quinte, open: use in organo pleno and in variations.
Octav 2': good with 8' alone; use as pleno.
Cornet V: brings out chorale melody, with Prinzipal 8'; adds force to the pleno.
Fagott 16': good for running basses in continuo work.

OBERWERK

Quintadena 8': use with wide, narrow stopped or open pipes.
Gedackt 8': use in continuo work; good with Waldflöte 2' or Sifflöte 1', especially in quick passages.
Nasat 2 2/3': useful in variations, bringing to other stops a particular pleasantness.
Tierce: can be combined with Nasat.
Quinte 1 1/3': good with Prinzipal 8' in running passages.
Vox humana: subtle like a human voice; on its own chest and enclosed within a thin-walled box so made that it can be played softer or louder; with its own soft Tremulant or Schwebung.

SEITENWERK

Quintadena 16': good for variations
Prinzipal 8': lieblicher than the other (Hw)
Salizional 8': delicate, good with Fugara 4' for running basses or arpeggios; useful for slow stringlike music with pedal Prinzipal 16' + Gemshorn 8'.
Waldflöte: good with Prinzipal or Gedeckt 8'.
Sifflöte 1': use in Seitenwerk pleno and with 8' alone in variations.
Trompete 8": for variations, or with Prinzipal 8' and drums.

PEDAL

Gemshorn 8': conical, imitates the bowed violine when played with the Prinzipal 16'.
Quinte 5 1/3': completes the pedal pleno.
Oktave 4': draw with the pedal reeds
Posaune 32': quick speaking, a pleasure to hear in the pleno.
Clarin 4': useful to bring out a chorale melody when drawn with the Prinzipal 16' or Violon 16".

SOURCE: Peter Williams, The European Organ 1450 - 1850 (Nashua: The Organ Literature Foundation, 1967), pp. 163 - 164.

Johann Adlung, a contemporary of Johann Sebastian Bach, made some interesting registration suggestions for the following disposition:

Figure 15a

1. Gedackt 16'
2. Prinzipal 8'
3. Quintatön 8'
4. Oktave 4'
5. Quinte 2 2/3'
6. Oktave 2'
7. Mixtur
8. Zimbel

Suggestions for registration:

Figure 15b

Alone or altogether: 1, 2, 3, 4, 6
Two stops: 1 + 3
2 + 1, 3, 4 or 6
4 + 1, 3 or 6
6 + 1 or 3
Three stops: 2 + 4 + 6 or 1 or 3
2 + 6 + 1 or 3
2 + 3 + 1
4 + 6 + 3
1 + 6 + 3
Four stops: 1 + 2 + 3 + 4 or 6
1 + 2 + 4 + 6
1 + 3 + 4 + 6
2 + 3 + 4 + 6
With Quinte 2 2/3': 2, 4; 2, 1, 4; 2, 3, 7; 4, 6.
With the Mixtur: 1, 2, 4; 2, 4, 6; 2, 4, 6, 3.
With the Zimbel: same combinations.

SOURCE: Peter Williams, The European Organ (Nashua: The Organ Literature Foundation, 1967), p. 147.

The famous organ builder Gottfried Silbermann made some suggestions for registration of two village organs, Grosshartmannsdorf 1741, and Frauenreuth 1742. The following disposition was available:

Figure 16a

HAUPTWERK	1) Principal 8'		7) Rohrflöte 8'	
	2) Octave 4'		8) Spitzflöte 4'	
	3) Quinte 2 2/3'		9) Kornett III	
	4) Superoctave 2'		10) Quintade 8'	
	5) Sesquialtera 1 3/5'			
	6) Mixtur IV 2'			
OBERWERK	11) Principal 2'		15) Gedeckt 8'	
	12) Quinte 1 1/3'		16) Rohrflöte 4'	
	13) Sifflet 1'		17) Nasard 2 2/3'	
	14) Zimbel II		18) Gemshorn 2'	
			19) Terz 1 3/5'	
PEDAL	20) Principal 8'	21) Subbass 16'		22) Posaune 16'

Suggestions for registration:

Figure 16b

Hauptwerk organo pleno consist of stops: 1 - 4, 6 and 7.
The Oberwerk organo pleno consist of stops: 11 - 16.
The following flute combinations are suggested: 7 - 8, 15 16, 1 8, 8 10, 15 16 18.
Nasard and third combinations: 15 16 17, 15 16 17 19, 15 17 19, 1 2 7 9.
Other elective combinations: 13 15 16, 13 15 17, 13 16 17, 12 13 15 17 19.
Trio combination: 21 22, 1 - 5 7, 11 13 15 18.

SOURCE: Hans Klotz, Über die Orgelkunst der Gotik, der Renaissance und des Barock (Kassel: Bärenreiter-Verlag, 1975), pp. 341 - 342.

The main principles of organ registration:

a) the establishment of the organo pleno
b) the use of non-principal flue pipes in elective combinations
c) the varying sound through highly coloured reed pipes

were developed in the Renaissance and early Baroque, but the scope of tonal resources expanded enormously in the mature Baroque. A full principal chorus was at the player's disposal in every division of the organ. The different organo plena contrasted and complemented each other. Silbermann voiced the pipes of the various divisions of the Hofkirche in Dresden as follows:

Hauptmanual von grossen und gravitätishen Mensuren
(large and heavy scaling)
Brust von delicaten Mensuren
(delicate, or pleasing i.e. delicious)
Oberwerk von scharfen und penetranten Mensuren
(sharp and cutting)
Pedal von starken und durchdringenden Mensuren
(forceful and penetrating)[4]

The same principles of design were valid for the organs of other great organ builders. Every division had a character of its own, and complemented the other ones. It stood in its own compartment, surrounded

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[4]Translated and quoted by Peter Williams, The European Organ 1450 - 1850 (Nashua: The Organ Literature Foundation, 1967), p. 152.

by a wooden case. The bigger instruments of the era, such as those mentioned above, could establish a reed organo pleno on the Hauptwerk as well as on the Rückpositive with 16' foundation (on the Hauptwerk with long resonating reeds and on the Rückpositive with short resonating reeds). Besides this, several reed organo plena were available on 8' basis, sometimes on 4' basis. The lingual pipes offered a wide range of canto-solo playing. Pedal divisions, especially, were well equipped with reeds; in bigger organs from 32' to 2' so that canto firmo playing in pedal could be accomplished in all ranges (bass, tenor, alto and soprano).

The function of the reeds was not simply to add loudness but to give variety and intensity of sound, and change of colour.

Non-principal flue pipes could be chosen in rich variety as either foundational stops or aliquots. As mentioned above, they could be used electively with members of the principal family as well as with members of the reed chorus. It was not customary to add non-principal flue pipes of equal pitch nor to add flutes higher than 4' level to the principal chorus; and never could a flute 2', 1 1/3' or 1' substitute for a principal crown.

The Organ from 1750 to 1900

During Classic and Romantic times the organ was not as highly favoured as it was during the Baroque era. The reason for this was partly the trend towards secularism. Society was not primarily interested in church life and church music. The majority of the great composers were therefore more involved in other media of musical performance, as for example in the piano and in the classical orchestra. With this trend, a decline of organ music and organ building went hand in hand.

It may also be observed that the Baroque organ was an instrument particularly effective in polyphonic structures, while Classic and Romantic music in their beginnings emphasized the simplicity of homophonic textures. Thus organ building was influenced. Already, famous organ builders such as Johann Gabler and Martin Engler had built, before 1750, instruments with many 8' duplications and omission of higher aliquots. Gabler's choir organ in Weingarten had seven stops at 8' pitch out of its total number of 11 stops in the Hauptwerk. Stops with string character were particularly favoured. Organists tried, effectively or not, to achieve crescendo by drawing more stops of the same pitch. With the abandoning of aliquots and mutation stops a subtle registration of polyphonic music was forfeited. Wilke, noted for his articles in the Allgemeine musikalische Zeitung, wrote:

> Mutations, like Mixtures, are highly regarded by many builders partly because prejudice makes them believe they give power to an organ, and partly because the number of stops is thereby increased without much cost or trouble.[5]

The main purpose of organ playing was, for many organists, solely the accompaniment of congregational singing.

Abbé Georg J. Vogler (1747-1814) tried to combine the orchestra sound with the organ in his invention of the "orchestrion"[6]; but this conception of organ building was not successful.

The Werkprinzip of the Baroque organ, meaning that every division of the organ projected the sound surrounded by its own wooden case, was abandoned by the Romantics. The function of the different manuals was

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[5]Translated and quoted by Williams, The European Organ, p. 165.

[6]A simplification of a unified swell organ. A description of this instrument is found in Emile Rupp, Die Entwicklungsgeschichte der Orgelbaukunst (Einsiedeln: Verlagsanstalt Benzinger & Co., 1929), pp. 91-126.

now more or less one of dynamics, from pianissimo to fortissimo.

The nineteenth century brought forward such technical inventions as the cone-valve chest and the tubular pneumatic tone-channel chest.[7] With the help of the latter invention, very large organs were produced, but the blend of the tone channel was abandoned and the organ pipe did not sound instantaneously when the key was depressed. The old art of scaling and intonation was discarded. Chiff and overtone are vital for clarity in polyphonic music. This clarity was lost as pipes were voiced with many nickings. In 1893, the organ builder, Weigle, invented pipes with a high wind pressure of 300 mm, through which the beauty of the organ tone was completely lost.

This negative summary does not mean that every organ built after 1750 was ill designed. There were many organ builders who worked with good intention, such as Ladegast, Walcker and Sauer. But the apex of organ building had been reached with Schnitger and Silbermann in the early eighteenth century, and many second-rate organ builders now tried to adjust the organ according to the taste of their time.

Tonal aspects which were particularly prominent in the nineteenth century, and which are still useful in modern organ building, included the swell box and certain character stops such as voix celestes and unda maris.

The Organ of the Twentieth Century

A period of organ restoration and renewal began with Albert

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[7] A description is found in Hans Klotz, The Organ Handbook (Saint Louis: Concordia Publishing House, 1969), p. 24 and pp. 30 - 37.

Schweitzer's pamphlet The Art of Organ Building and Organ Playing in Germany and France (1906). Schweitzer criticised the lack of real craftsmanship and the decline in organ design which was evident particularly in the big Romantic organs of the nineteenth century. His main proposals toward a renewal of organ design were use of the slider chest, mechanical key action, lower wind pressure, and high and free placement of the instrument. Another event which gave momentum to the organ renewal was the building of the Praetorius organ in Freiburg, 1921, according to the specifications which Praetorius gave in Syntagma Musicum, Vol. II, De Organographia. Hereafter, organ conferences were held with participation of organ builders, organists, musicologists, theologians and scientists which emphazised the renewal of organ design.

Renowned teachers and organists such as Karl Straube, Günther Ramin, Fritz Heitmann, Helmut Walcha and many others became aware that Romantic performances of music written before 1750 had altered the conception and style of Baroque and Renaissance music and that it was necessary in order to achieve authentic performances to play this music in the style in which it was originally conceived. The result of this movement was a new organ design oriented towards the great organs of the Renaissance and Baroque eras; and old principles of organ registration were rediscovered. Composers such as Paul Hindemith, Hugo Distler, Ernst Pepping, Johann N. David became interested in this renewed instrument and composed music which could be effectively performed.

Many books and articles were written in which the results of the organ movement were analysed and utilized. Ernst K. Rössler[8] gives a

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[8] Klangfunktion und Registrierung (Kassel: Bärenreiterverlag, 1952), pp. 35-57.

plan of registration which summarizes the before-mentioned ideas and unfolds them in the following way:

There are three groups of stop amalgamations,
organum plenum (the principal chorus)
organum electum (elective registration, the foundation stop will be a non-principal flue pipe)
organum varianum (varying the sound through a combination with reed pipes)

The Organo Pleno

The organo pleno features the principal pyramid with overtones in octaves and fifths (8', 4', 2 2/3', 2'; the higher partials are assembled in a mixture). All pipes must have genuine principal scaling; no flutes are allowed in the overtone row because they would thicken the sound. The higher partials should have a relatively narrower diameter in scaling than the lower ones. This tonal concept is ideal for florid passages. It gives clarity for polyphonic structures, as well as dignity. The addition of pitch level will clarify on which fundamental the organo pleno is based. It can be marked "organo pleno 16'", or "organo pleno 4'". To differentiate the diverse character of the pleno of the Hauptwerk, Oberwerk, Brustwerk or Rückpositive one should use the abbreviations of these divisions and write "HW org. pleno 16'" or "RP org. pleno 8'". If couplers are used the abbreviation RP/HW or II/I can stand for this.

Long resonating reeds can be added to the organo pleno (Trompeten, Posaunen, Zinken) in order to achieve strength and colour of a reed organo pleno. Furthermore, the wide-scaled Kornett mixture could be added. If one wished to use this registration as separate sound for a cantus firmus, the designation "cantu solo" is added. The designation "organo pleno mutato" implies a change (mutation) of the normal principal pyramid. It can mean that a certain pitch level is omitted as, for example,

the 4'. It would be specified with the word "sine" (without), as "organo pleno mutato 8' sine 4'". The margin of the aliquote can be designated with the words:

aequo (meaning only foundation stops)
non alto (including the third partial, or 2 2/3' for 8' pitch)
alto (from fourth to sixth partial, or 2' and 1 1/3' for 8' pitch)
altissimo (highest partials, 1' and above for 8' pitch).

An "organo pleno mutato non altissimo" would be registered

Prinzipal 8'
Oktave 4'
Quinte 2 2/3'
Oktave 2'
(Quinte 1 1/3')

an "organo pleno mutato alto 16'"

Prinzipal 16'
Oktave 8' (+ Quinte 5 1/3' if present)
Oktave 4'
Quinte 2 2/3'

an "organo pleno mutato non alto"

Prinzipal 8'
Oktave 4'
Quinte 2 2/3'.

The function of the above mentioned plena would be to give slower moving textures an effective registration.

If a registration for fast moving passages is needed, one would exchange the Prinzipal 8' with a Gedeckt 8' or Quintade 8', leaving out the 4', and adding a Mixture. The technical term for this would be "organo pleno mutato sola voce",which would be realised;

Quintade 8'
Oktave 2'
Quinte 1 1/3'
Mixture 1'

If a softer organo pleno is needed the registration would be called "organo pleno mutato mf".

The Organo Electo

The "organo electo" group chooses a non-principal foundational flue stop which is played singly or in combination with aliquots selected electively (8' + 1 1/3'; 8' + 2 2/3'; 8 ' + 2 2/3' + 1 3/5'; 16' + 4'; 4' + 1'; 8' + 4'; 8' + 2'; etc.). The overtone pyramid is not made complete as in the organo pleno in its full form. Characteristic for the electo group is the combination of stops of different scaling and pitch. Stops of the same pitch are not combined (Gedeckt 8' + Flöte 8' + Gambe 8' + Salicet 8') because the resulting sound would be cloudy and, furthermore, strength is not significantly increased by adding stops of equal pitch (50 phone + 50 phone = 53 phone). While the "organo pleno' contains more strength and loudness, the "organo electo" has more chamber-music character. Very narrow string stops do not belong to the electo group because they do not blend well with higher aliquots. They should be classified as "character" stops. If a greater loudness is required to emphasize a cantus firmus, the designation "cantu solo" should be added. The qualifications "sine", "aequo", "non alto","altissimo" clarify the overtone pitch level. If a different foundational pitch than 8' is required, the indication of the pitch would suffice ("organo electo 4'"). Higher aliquots of the principal pyramid combine well with foundational stops of the electo family. Such a combination would be called "organo pleno mutato". The following combinations illustrate these sonorities:

Gedeckt 8' + Mixture
Flöte 8' + Oktave 2'
Rohrflöte 8' + Quinte 1 1/3' + Oktave 1'

The Organo Variano

The "organo varianum" consists of stops with short-resonating reeds. They can be combined with aliquots of the electo and pleno families. The characteristic feature of this group is the rich, intense color which does not lose its linearity in polyphonic textures. Well known stops of this category are Sordun, Rankett, Bärpfeife, Regal, and Krummhorn. Suggested combinations are:

Regal 8' + Gedeckt 4'
Krummhorn 8' + Quinte 1 1/3'
Bärpfeife 16' + Oktave 1'
Rancket 8' + Zimbel.

A selection with an mf-organo pleno is possible. The designation for this combination would be "organo variano principale".

Long-resonating reeds belong to the full organo pleno group, or are used as variano cantu solo. Reeds which emphasize only color, lacking linearity for polyphonic structures, can be used in an "organum varianum cantu solo".

CHAPTER II

REGISTRATION OF HINDEMITH'S ORGAN SONATAS

The organ sonatas by Paul Hindemith, written between 1937 and 1940, contain no indications of registration. It is therefore of interest and concern to the organist to translate the many dynamic markings and to interpret the style through correct registration. The ultimate aim of this study is to apply to these sonatas the principles of organ registration which are defined in the first chapter.

As a representative disposition for this study, the specification of the new organ of the University of Alberta (to be installed in November 1977) is taken. It has the following design:

HAUPTWERK	RÜCKPOSITIV
Bordun 16'	Gedeckt 8'
Praestant 8'	Praestant 4'
Hohlflöte 8'	Rohrflöte 4'
Oktave 4'	Oktave 2'
Spitzflöte 4'	Quinte 1 1/3'
Nasat 2 2/3'	Sesquialtera II
Oktave 2'	Scharf IV
Blockflöte 2'	Krummhorn 8'
Terz 1 3/5'	Tremulant
Mixtur V	
Trompete 8'	
SCHWELLWERK	**PEDAL**
Offenflöte 8'	Subbass 16'
Gemshorn 8'	Oktave 8'
Schwebung (TC)	Gedacktbass 8'
Oktave 4'	Oktave 4'
Querflöte 4'	Mixtur IV
Waldflöte 2'	Posaune 16'
Mixtur V	Trompete 8'
Fagott 16'	Schalmei 4'
Trompete 8'	
Tremulant	

Registration of Sonata I

A. First Movement

The first movement commences with a festive introduction of 52 bars preceding the first subject. Begin with the following registration:

HAUPTWERK	organo pleno:	RÜCKPOSITIVE	organo pleno:
	Praestant 8'		Gedeckt 8'
	Oktave 4'		Praestant 4'
	Oktave 2'		Oktave 2'
	Mixtur V		Quinte 1 1/3'
			Scharff IV
SCHWELLWERK	organo pleno:	PEDAL	organo pleno:
	Offenflöte 8'		Subbass 16'
	Oktave 4'		Oktave 8'
	Mixtur V		Oktave 4'
			Mixtur IV

Performance Plan:

BARS

$1 - 5^1$ Hauptwerk.

$5^2 - 11^1$ Rückpositive.

$11^2 - 12^3$ Hauptwerk.

$12^3 - 15^1$ Schwellwerk; the swell shutters are closed at the beginning of this phrase and should be gradually opened towards the highest point of melodic line.

$15^2 - 17^1$ Hauptwerk.

$17^2 - 22^1$ Rückpositive without Scharff IV and Pedal without Mixture.

$22^2 - 27^2$ Schwellwerk without Mixture; the pianissimo section with closed swell shutters and the piano section with opened shutters.

$27^3 - 31$ Hauptwerk without Mixture.

$32 - 33^2$ Rückpositive or Schwellwerk without Mixtures.

$33^3 - 43$ Hauptwerk; from 36^3 add Hauptwerk Mixture; Pedal without Mixture.

$44 - 52$ Schwellwerk; the piano parts with closed shutters; the mezzo-forte section with opened shutters.

The whole introduction may be played in organo pleno, which provides unity as well as grandeur of sound and permits linearity of the melodic lines, preventing kaleidoscopic disintegration. Contrast and dynamic change

is provided by the different characters of the organo plena in the diverse manual divisions, as well as by the removal of mixtures, and the use of the shutters.

The exposition of the first movement (bar 53 - 133) may be registered as follows:

HAUPTWERK	organo electo principale
	Hohlflöte 8'
	Oktave 4'
	Oktave 2'
RÜCKPOSITIVE	organo electo principale
	Gedeckt 8'
	Rohrflöte 4'
	Oktave 2'
	Quinte 1 1/3'
SCHWELLWERK	organo electo principale
	Offenflöte 8'
	Mixtur V
PEDAL	organo electo principale
	Subbass 16'
	Gedecktbass 8'
	Oktave 4'

The player should follow this plan:

BARS	
53 - 67	Hauptwerk
68 - 75^1	Rückpositive
75^2 - 79^1	Hauptwerk plus Rückpositive
79^2 - 86	Rückpositive
87 - 133	Schwellwerk, beginning with closed shutters, bar 104 half open, bar 121 completely open.

After the festive introduction the exposition is played with an electo principale to demonstrate the lighter mood and the agility of the thematic and motivic material. In order to give contrast between the sections in which the first and second subject are stated, the first is played on the Hauptwerk and Rückpositive with an electo principale alto (combining wide scale foundational stops with principals of 2' and 1 1/3' pitch), while

the second is played with an electo principale altissimo sound (wide scale foundational stops combined with highest principal pitches). The last registration achieves clarity for the contrapuntal texture of this section and provides, by means of the shutters, the dynamic changes which are required.

The brief section, bars 134-164, exhibits an abrupt change of melody and texture. This requires a different registration, such as the following:

HAUPTWERK	organo electo non alto
	Hohlflöte 8'
	Nasat 2 2/3'
RÜCKPOSITIV	organo electo non alto
	Gedeckt 8'
	Rohrflöte 4'
SCHWELLWERK	organo electo aequo
	Gemshorn 8'
PEDAL	organo electo non alto
	Subbass 16'
	Gedecktbass 8'

to be played in this manner:

BARS	
134 - 143	Schwellwerk with closed shutters
144 - 164	left hand on Schwellwerk, right hand on either Hauptwerk or Rückpositive.

The different character of this section is exemplified through the difference of sound of an organo electo aequo or a non alto in contrast with the organo pleno principale of the previous section.

The development section (bar 165 - 287) requires a new setting of registration. The following is recommended:

HAUPTWERK — organo pleno
Praestant 8'
Oktave 4'
Oktave 2'
Mixtur V

RÜCKPOSITIV — organo pleno
Gedeckt 8'
Oktave 4'
Oktave 2'
Quinte 1 1/3'
Scharf IV

SCHWELLWERK — organo pleno mutato
Offenflöte 8'
Querflöte 4'
Mixtur V

PEDAL — organo pleno
Subbass 16'
Oktave 8'
Oktave 4'
Mixtur IV

to be played in this manner:

BARS

165 - 231 Rückpositive

232 - 251 Hauptwerk

252 - 269 Hauptwerk + Trompete, Pedal + Posaune 16'

270 - 287 Schwellwerk with closed shutters.

The development section highlights once more the diverse organo plena of the organ, (bars 252 - 269 with long resonating reeds) ending this section with a softer organo pleno mutato on the closed swell.

For the recapitulation (beginning bar 288) a similar registration as that for the exposition could be used:

HAUPTWERK — organo electo principale
Rohrflöte 8'
Oktave 4'
Oktave 2'

RÜCKPOSITIV — organo electo principale
Gedeckt 8'
Rohrflöte 4'
Oktave 2'
Quinte 1 1/3'

SCHWELLWERK organo electo non alto
Gemshorn 8'
Querflöte 4'

PEDAL organo electo principale
Subbass 16'
Gedecktbass 8'
Oktave 4'

Performance plan:

BAR

288 - 302 Rückpositive
303 - 310 Hauptwerk
310^2 - 318^1 Hauptwerk plus coupled Rückpositive
318^2 - 322^2 Rückpositive
322^3 - 328 Schwellwerk (Pedal - Oktave 4')

The coda (beginning bar 329) needs the softer stops of the electo group:

HAUPTWERK organo electo alto
Hohlflöte 8'
Blockflöte 2'

RÜCKPOSITIV organo electo non alto
Gedeckt 8'
Rohrflöte 4'

SCHWELLWERK organo electo non alto
Gemshorn 8'
Querflöte 4'

Performance plan:

BARS

329 - 339 Hauptwerk
340 - 350 Rückpositive
351 - 361 Schwellwerk with closed shutters
362 - 372 right hand on Schwellwerk with Gemshorn 8' only
left hand on Rückpositive with Gedeckt 8' only.

The fading away of this movement is best expressed with the organo electo group. It is obvious through the detailed scheme of registration that the coda starts on the Hauptwerk with an electo registration 8' + 2'

(alto), continues with 8' + 4' (non alto) beginning at bar 340 with closed swell shutters in bar 351, and ends with 8' stops (aequo). From the facts mentioned above one can summarize the main scheme of registration as follows:

Introduction: organo pleno
Exposition: organo electo principale
Codetta: organo electo
Development: organo pleno
Recapitulation: organo electo principale
Coda: organo electo

B. Second Movement

The contrapuntal lyricism of this movement requires chamber music combinations of the organo electo or organo variano group. Many possibilities of registration are available for this movement, for example:

	Right Hand		Left Hand	
1.	HAUPTWERK	Hohlflöte 8' Nasat 2 2/3'	RÜCKPOSITIV	Gedeckt 8' Rohrflöte 4'
2.	RÜCKPOSITIV	Krummhorn 8' Quinte 1 1/3'	SCHWELLWERK	Gemshorn 8' Querflöte 4'
3.	RÜCKPOSITIV	Gedeckt 8' Sesquialtera II	SCHWELLWERK	Offenflöte 8' Waldflöte 2'
4.	SCHWELLWERK	Offenflöte 8' Waldflöte 2'	RÜCKPOSITIV	Krummhorn 8' Rohrflöte 4'
5.	HAUPTWERK	Hohlflöte 8' Blockflöte 2'	SCHWELLWERK	Offenflöte 8' Querflöte 4'
6.	HAUPTWERK	Hohlflöte 8' Nasat 2 2/3' Terz 1 3/5'	SCHWELLWERK	Gemshorn 8' Waldflöte 2'

PEDAL (for any of the above combinations) Subbass 16' and Gedecktbass 8'.

If necessary, further stops for the pedal could be borrowed from the manual divisions. In cases where the Hauptwerk is not used for the hands the entire bass could be supplied by stops from the electo group of the Hauptwerk (16', 8', 4'). The dynamic changes from p to mf or f can be

achieved by opening the swell shutters, or by adding a soft 4' stop.

C. Third Movement

This movement is very sectional and rhapsodic, requiring many different gradations of the organo pleno groups.

The following registration should be used at the beginning:

HAUPTWERK — reed organo pleno
Praestant 8'
Oktave 4'
Oktave 2'
Mixtur V
Trompete 8'

RÜCKPOSITIV — organo pleno
Gedeckt 8'
Praestant 4'
Oktave 2'
Quinte 1 1/3'
Scharf IV

SCHWELLWERK — organo pleno
Offenflöte 8'
Oktave 4'
Mixtur V

PEDAL — reed organo pleno
Subbass 16'
Oktavbass 8'
Oktave 4'
Mixtur IV
Posaune 16'
Trompete 8'
Schalmei 4'

Plan of performance:

BARS

1 - 3 Hauptwerk

4 - 9 Hauptwerk, without Trompete

10 - 15 Schwellwerk, beginning with closed swell shutters which are gradually opened at bar 14

16 - 18^1 Rückpositiv; pedal without reeds

18^2 - 20^1 Schwellwerk

20^2 - 24^2 Schwellwerk, beginning with closed swell shutters; these are gradually opened from bar 22 - 23

24^3 - 30 Hauptwerk

31 - 35^1 Schwellwerk, beginning with closed swell shutters which are gradually opened at bar 33 - 34.

35^2 - 40^1 Rückpositiv

40^2 - 52 Hauptwerk.

D. Fourth Movement

This movement, an idyllic Rondo, contrasting with the preceding imposing free fantasia, requires the gentle beauty of the stops of the electo group. Hindemith indicates three basic dynamic levels, which are:mf, p, and pp. These are attainable with the following registration:

HAUPTWERK organo electo alto (mf)
Hohlflöte 8'
Blockflöte 2'

RÜCKPOSITIV organo electo non alto (p)
Gedeckt 8'
Rohrflöte 4'

SCHWELLWERK organo electo non alto (pp)
Gemshorn 8' (closed swell shutters)
Querflöte 4'

PEDAL organo electo non alto
Subbass 16'
Gedecktbass 8'

Details of the performance plan are as follows:

BARS

1 - 10^2 Hauptwerk

10^3 - 14^1 Schwellwerk

14^2 - 25^2 Rückpositive

25^3 - 41^1 Hauptwerk

41^2 - 51^2 Schwellwerk (with opened swell shutters)

51^3 - 52^2 Schwellwerk (without Querflöte 4')

53^3 - 64 Schwellwerk (with closed swell shutters)

65 - 78 left hand on Schwellwerk,
right hand on Hauptwerk with Spitzflöte 4' and Blockflöte2'

79 - 85^1 Schwellwerk

85^2 - 90^2 Schwellwerk (+ Querflöte 4'), from bar 87^3 with opened swell shutters.

90^3 - 97^2 Rückpositive

97^3 - 100 Rückpositive, Gedeckt 8' only

101 - 115 Schwellwerk, Gemshorn 8' only from bar 111 with closed swell shutters.

This concept and plan of registration of Hindemith's Sonata I shows in detail how to select the registers within their own groups (pleno, electo and variano) and how to combine or relate them with stops of other groups according to texture, function and expression of the music. The stops are organized with much variety, avoiding kaleidoscopic confusion. They are used according to the function of their sound, relating them to the function of the music.

Registration of Sonata II

A. First Movement

The first movement, a Rondo which is light in mood, requires a light organo pleno. For the first section, Hindemith selects three dynamic levels, f, mf, and p. This can be achieved in the following way:

HAUPTWERK — organo pleno mutato sola voce (f)
Hohlflöte 8'
Oktave 4'
Oktave 2'
Mixtur V

RÜCKPOSITIV — organo pleno mutato (mf)
Gedeckt 8'
Rohrflöte 4'
Oktave 2'
Scharf IV

SCHWELLWERK — organo pleno mutato (closed swell shutters) (p)
Offenflöte 8'
Querflöte 4'
Mixtur V

PEDAL — organo pleno
Subbass 16'
Oktave 8'
Oktave 4'
(Mixtur IV)

The episode (bar 32 - 71) is playful in its character and should be performed with a delicate, electo principale sound. It could be played on the Rückpositive in the following manner:

mf sections: Gedeckt 8', Rohrflöte 4', Oktave 2', Quinte 1 1/3'
p sections: Gedeckt 8', Oktave 2', Quinte 1 1/3'
pp sections: Gedeckt 8', Quinte 1 1/3'.

The reappearance of the Rondo theme (bars 72 - 106) should be played in the same manner as the first Rondo section. Bars 106 - 129 of the succeeding second episode can be performed in the light electo principale character which was chosen for the first episode. From bars 129-153, which are more homophonic in texture, an organo electo aequo or non alto would be suitable. The best division on which to perform this would be the Schwellwerk:

pp sections: Gemshorn 8' (or Offenflöte 8')
mf sections: Gemshorn 8' Oktave 4' (closed swell shutters)
f sections: Gemshorn 8' Oktave 4' (opened swell shutters).

The last Rondo-theme section (bar 154 - 183) should be registered again in the lighter organo pleno mutato of the first Rondo section in order to achieve balance of form.

B. Second Movement

For the second movement, a beautiful siciliano in binary form, Hindemith designates the manual changes. The Oberwerk section is to be played "piano", the Hauptwerk section "mezzo forte". The melody is repeated on the Hauptwerk with varied accompaniment and with a pedal bass. In order to achieve the colour and pastoral mood, the second movement could be played with the following stops of the organo electo and organo variano groups:

First Oberwerk section (bars 1 - 10^1)

RÜCKPOSITIV organo electo non alto
Gedeckt 8'
Rohrflöte 4'

First Hauptwerk section (bars 10^2 - 21)

HAUPTWERK organo electo alto
Hohlflöte 8'
Blockflöte 2'

Second Oberwerk section (bars 20^2 - 38^2)

RÜCKPOSITIV organo variano
Krummhorn 8'
Rohrflöte 4'

Second Hauptwerk section (bars 38^3 - 56^2)

SCHWELLWERK organo electo alto
Offenflöte 8'
Waldflöte 2'

The coda should have the same registration as either the first or the second part of the binary form.

The Pedal registration throughout is:

PEDAL organo electo non alto 16'
Subbass 16'
Gedacktbass 8'

C. Third Movement

The third movement, a fugue with an agile subject, should be played gaily (heiter) in a transparent, organo electo principale sound which builds to a full organo pleno and recedes to pp-organo electo principale. The dynamic curve which is presented twice in this movement could be realised in the following way on the Rückpositive:

pp: Gedackt 8', Oktave 2', Quinte 1 1/3'
p: the above + Rohrflöte 4'
mp-mf: the above + Oktave 4'
f: The above + Scharf IV.

The Pedal would have to be adjusted to the crescendo, and this may be accomplished by coupling the Rückpositive to foundational pedal stops (16', 8').

Registration of Sonata III

A. First Movement

Each movement of the third sonata uses a different German folksong as a cantus firmus. This first movement presents the cantus firmus twice, once in the bass, then in the soprano. Hindemith indicates many crescendos and diminuendos which suggest that the movement should be played on the swell. Register changes are best carried out at the start of a new phrase. One might exploit the diverse degrees of the organo plena in the first part of this movement (bass cantus firmus). The second part of the movement (beginning at bar 29) should commence with a tender, electo non alto sound (Gemshorn 8' + Querflöte 4') with closed swell shutters. The swell shutters should be gradually opened, as the crescendo indicates. From bar 40^4 onward, full organo pleno should be used, but with closed swell shutters which should then be gradually opened towards the fff. The end of the piece (beginning bar 44^4) requires a soft organo electo aequo, which is effectively presented with the Gemshorn 8'. During the playing of the last two bars of this movement, the shutters should be closed gradually. The Pedal has to be adjusted to the volume of the music, conveniently done through coupling.

B. Second Movement

The cantus firmus of the second movement appears in the tenor and can be played effectively with a short resonating reed (organo variano). The soprano and alto exhibit a tightly knit texture of subtle, motivic development, requiring a transparent registration which can be achieved

through an organo electo alto sound on the swell. The slight crescendo and diminuendo can be effected with the swell shutters. The pedal assumes a simple bass function and should be played with soft foundational 16' and 8' stops (organo electo aequo). The registration, therefore, should be as follows:

SCHWELLWERK	organo electo alto
(right hand)	Gemshorn 8'
	Waldflöte 2'
RÜCKPOSITIV	organo variano non alto
(left hand)	Krummhorn 8'
	Rohrflöte 4'
	Tremulant (optional)
PEDAL	organo electo non alto
	Subbass 16'
	Gedacktbass 8'

C. Third Movement

The third movement strongly resembles a chorale prelude because of the prominence of the cantus firmus which is in the tenor voice played by the pedal. It should be registered with a projecting organo variano timbre (organo variano cantu solo) which can be achieved by the use of a Trompete 8' in combination with Oktave 4' or Schalmei 4', both available in the Pedal division. The manual voices playfully surround the cantus firmus. They need the clarity and substance of a mf-organo pleno in order to provide transparency to the contrapuntal design and enough prominence so that the left hand, in particular, having bass function, is not overshadowed by the Trompete 8'. The movement is, in itself, so finely wrought that it can well be performed without observing the dynamic designations. Hindemith, in conversation with organist, Dr. Robert Noehren, agreed that this movement can be played without crescendos and

diminuendos.[9]

Suggested registration:

RÜCKPOSITIV	organo pleno	(mf)
	Gedackt 8'	
	Rohrflöte 4'	
	Oktave 2'	
	Scharf IV	
PEDAL	organo variano cantu solo	
	Trompete 8'	
	Oktave 4' (or Schalmei 4')	

[9]See Bolitho, Albert G. "The Organ Sonatas of Paul Hindemith" (Ph.D. dissertation, Michigan State University, 1968), p. 118.

CONCLUSION

It has been shown that principles of organ registration developed along with the history of organ design. In order to select suitable registration it is important for one to understand the tonal function of organ stops (flutes, principals, reeds, etc.) within their respective families. In a well-designed instrument, in which the nomenclature of stops has been correctly observed, the stops can be classified into three main divisions:

1. organo pleno
2. organo electo
3. organo variano.

These three groups offer many diverse mutations adaptable to the style and texture of the music. Hindemith's organ sonatas exhibit great variety of form, texture, expression and dynamics. The tonal concepts mentioned above have been applied to the sonatas; their observance will enable the organist to register according to the nature of the organ and the function of the music.

BIBLIOGRAPHY

Books

Adelung, Wolfgang. Einführung in den Orgelbau. Wiesbaden: Breitkopf & Härtel, 1974.

Apel, Willi, ed. Harvard Dictionary of Music. 2nd ed. S.v. "Organ" pp. 609 - 620. Cambridge, Massachusetts: The Belknap Press of Harvard University Press, 1975.

Blume, Friedrich, ed. Die Musik in Geschichte und Gegenwart. S.v. "Orgel" vol. X, cols. 228-331. Kassel: Bärenreiter-Verlag, 1962.

Bolitho, Albert George. "The Organ Sonatas of Paul Hindemith." Unpublished Ph.D. dissertation, Michigan State University, 1968.

Douglas, Fenner. The Language of the Classical French Organ. New Haven: Yale University Press, 1974.

Eggebrecht, Hans H., ed. Riemann Musik Lexikon, Sachteil. S.v. "Orgel" pp. 683-687. Mainz: B. Schott's Söhne, 1967.

Gleason, Harold. Method of Organ Playing. 5th ed. New York: Appleton-Century-Crofts, 1962.

Goode, Jack C. Pipe Organ Registration. Nashville: Abingdon Press, 1964.

Klotz, Hans. Über die Orgelkunst der Gotik, der Renaissance und des Barock. Kassel: Bärenreiter-Verlag, 1975.

_____. The Organ Handbook. Trans. Gerhard Krapf. Saint Louis: Concordia Publishing House, 1969.

Mahrenholz, Gerhard. Musicologica et Liturgica, ed. Karl F. Müller. Kassel: Bärenreiter-Verlag, 1960.

Praetorius, Michael. Syntagma Musicum, Tomus Secundus. Publikation Aelterer Praktischer und Theoretischer Musikwerke, Band XIII. New York: Broude Brothers, 1966.

Rössler, Ernst Karl. Klangfunktion und Registrierung. Kassel: Bärenreiter-Verlag, 1952.

Rupp, Emile. Die Entwicklungsgeschichte der Orgelbaukunst. Einsiedeln: Verlagsanstalt Benzinger & Co., 1929.

Sumner, William Leslie. The Organ. London: MacDonald, 1973.

Williams, Peter. The European Organ 1450 - 1850. Nashua, New Hampshire: The Organ Literature Foundation, 1967.

Music

Hindemith, Paul. Sonate I. Mainz: B. Schott's Söhne, 1937.

_____. Sonate II. Mainz: B. Schott's Söhne, 1937.

_____. Sonate III. Mainz: B. Schott's Söhne, 1940.

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